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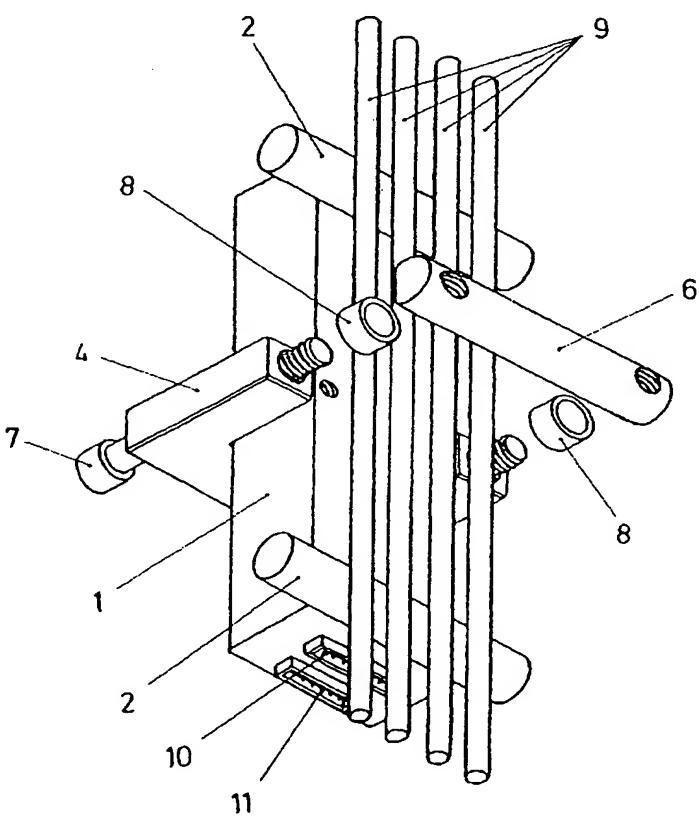
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(54) Title: INSTRUMENT FOR MEASURING SUSPENDED MASSES FOR MACHINES THAT OPERATE WITH TRACTION CABLES

(54) Título: INSTRUMENTO DE MEDIDA DE MASAS COLGANTES PARA MÁQUINAS QUE FUNCIONAN CON CABLES DE TRACCIÓN



(57) **Abstract:** The invention relates to an instrument for measuring suspended masses for machines that operate with traction cables. The inventive instrument consists of a body (1) and end stops (2) which are used to support the cables being used (9). An element (6), which is disposed in the central section of the instrument, applies pressure on the cables (9). The aforementioned element (6) comprises a cylinder which is fixed to a support (4) by means of cylindrical washers (8). Said washers, which can be substituted, are used to determine the separation distance between the cylinder (6) and the body (1) for the passage of the cables (9).

(57) **Resumen:** Instrumento de medida de masas colgantes para máquinas que funcionan con cables de tracción, comprendiendo un cuerpo (1) en el que se incorporan unos topes extremos (2) para apoyo de los cables (9) de aplicación, disponiéndose en la zona media un elemento (6) de presión sobre los cables (9), formado por un cilindro que se sujetă sobre un soporte (4) con inclusión de unas arandelas cilíndricas (8) sustituibles, mediante las cuales se establece una separación selectiva del cilindro (6) respecto del cuerpo (1) para el paso de los cables (9) de aplicación.

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1 "MEASURING INSTRUMENT FOR HANGING MASSES FOR MACHINES
WHICH WORK WITH TRACTION CABLES"

5 The present invention refers to a measuring instrument with hanging masses fro machines which work with traction cables, bringing about some improvements
which affect the structure of the instrument, with
repercussion on its functional behaviour.

10 The instrument to which the invention refers is for application with general character in the hoisting area for any type of charge by means of the use of traction cables and in a particular way in the industry of lift installation with elevation by means of cables.

15 The existence of mass weighing systems which hang on cables is known in several applications, the mentioned systems are essentially made up of two independent parts, being one of them a sensing device and the other an electronic data processing centre, being it necessary to join both parts with connecting cables, which supposes an important inconvenience, as in
20 the lift installations, the availability of space is very reduced. These systems require moreover a calibration of the installation, for which it is necessary to use reference masses hanging from the cables of application.

25 To the respect, Patent number 9801300 presents an instrument which is configured in a monoblock set, incorporating in the mentioned set a tension detecting transducer for the cables of application and their variations, as well as a processor to translate the
30 tension signals of the cables into weight units.

The mentioned instrument of Patent number 9801300 is made up of a central body, on which some supporting stops of the cables of application are incorporated and centrally a pressure flange on the cables, including in
35 the central body the electronic operation components.

1 The pressure flange on the cables is included in
its case with a fixed position fastening respect to the
central body and structured with some housing cells for
the cables of application, which conditions the
mentioned flange, in the application, for a certain
5 number of cables and respect to the diameter of the
same, so that it is necessary to use in each case a
different flange in function of the number and of the
diameter of the cables of the installation of
application.

10 According to the present invention, a similar
instrument to the one mentioned in Patent number 9801300
is proposed, but with some improvements referring to the
pressure flange on the cables, in such a way that some
15 more advantageous features are obtained, allowing the
use of the same flange independent from the cables of
application.

20 This instrument object of the invention is made up
of a central body which houses the electronic operation
components, with terminals to the outside for the
necessary connections, having on the mentioned body some
supporting stops for the cables of application and in
the central area a pressure flange of the cables towards
the central body, the mentioned flange is made up of a
25 cylinder which is supported by means of fastening screws
respect to a support fastened to the central body,
including in the fastening tying of the mentioned
cylinder some cylindrical washers which act as
separating devices between the mentioned cylinder and
30 the fastening support.

35 This way an instrument is obtained which can be
applied for any number of cables, as the cylinder which
makes up the pressure flange on the cables shows a
continuous front which can lean on the cables of
application without defined points respect to the same,

1 so that the support is susceptible without any condition
respect to the number of cables, whenever the set of
these remains within the longitudinal measure of the
mentioned pressure cylinder.

5 The separating washers between the cylinder and the
fastening support, determine the separation of the
cylinder respect to the central body, so that the cables
of application can enter between both, so that by
substituting the mentioned washers the separating space
between the cylinder and the central body can be
10 modified in function of the diameter of the cables of
application, being the instrument usable with the same
pressure cylinder for cables of any diameter.

15 This way an instrument is obtained with some really
advantageous features for the measuring of the hanging
masses in function of the tension of the supporting
cable, acquiring the mentioned instrument own life and
preferable character respect to the previously known
instruments with the same function.

20 Figure 1 shows an exploded upper view of the
instrument object of the invention, without the
supporting stops for the cables of application on the
central body.

25 Figure 2 is an upper view of the connected previous
set.

Figure 3 is a side view of the complete set of the
preconized instrument.

Figure 4 is a corresponding front rear view of the
instrument.

30 Figure 5 is a perspective of the instrument in
assembly phase respect to some cables of application.

Figure 6 is a perspective of the instrument in
practical disposition on the cables of application.

35 The measuring instrument of the hanging masses,
object of the invention is made up of a central body (1)

1 structured according to an enlarged prismatic shape, in
hard material of some adequate elastic constants.

5 Referring to the extreme areas of one of the front faces, some transverse stops (2) are situated on the mentioned body (1), made up of cylinders which remain leaned on the body (1) being supported by means of fastening screws (3).

10 In the central area of the body (1) moreover a support (4) is incorporated in the shape of a "U" which surrounds the mentioned body (1) at the rear part, being fixed by means of some respective fastening screws (5), while at the front part transversely a cylinder (6) is situated which is held fixed on the support (4) by means of fixing screws (7).

15 Between the cylinder (6) and the support (4) some cylindrical washers (8) are included in the fastening supports. The cylindrical washers establish a separation of the mentioned cylinder (6) to the outside, determining a separation space between the mentioned cylinder (6) and the body (1), which is a function of 20 the longitudinal dimension of the washers (8).

25 With it this way, the instrument can be applied in its practical disposition with respect to the supporting cables (9) of the hanging masses of application, in the way shown on figures 5 and 6, i.e. situating the body (1) with the stops (2) leaned on the cables (9), incorporating afterwards at the other side of the cables (9) the cylinder (6) with the washers (8) intercalated in the fastening with respect to the support (4), so 30 that when the screws (7) are fastened, the cylinder (6) remains tight against the washers (8) and these against the support (4), a bending of the cables (9) is established, as indicated on figure 6.

35 This way a disposition results in which the tension of the cables (9) exerts an opposed reaction on the

1 supports on the stops (2) and on the cylinder (6), which
allows to detect, by means of the corresponding sensing
devices, the variations of tension the cables suffer
(9), when the suspended charge is increased or reduced,
to translate the mentioned variations into weight units,
5 being it possible to make the mentioned variations of
the cable (9) tensions rebound, in any system, such as
for example the security control of elevation devices,
such as lifts, cranes, etc...

10 In the body (1) the necessary electronic components
are included to show the variations of the cable (9)
tensions of application and to process the corresponding
data so as to translate the mentioned variations of the
cable tension (9) into weight units, for example to
reflect it on a visualization screen, as well as to
15 generate the administration signals for any type of
control.

20 In this sense, in the central body (1) a transducer
is included and a microprocessor circuit, with terminals
(10) and (11) to the outside to establish the necessary
connections.

25 According to a realization shape, the
microprocessor circuit is foreseen, for example, with an
intercommunicated regulating device with some
piezoresistive sensing devices placed on the central
body (1), which are connected with a conditioning
amplifying device, whereafter an analog / digital
converter is connected to a controller foreseen of a
visualization display and with programming keys.

30 According to its supporting function for the cables
(9) of application, the stops (2) and the cylinder (6)
are made up of a resistant material to the effect, as
well as a smooth exterior surface so that the cable (9)
friction is minimum.

35 The stops (2) and the cylinder (6) allow the

1 support of any number of cables which remain as a whole
inside the longitudinal measure of the cylinder (6)
between its fastening fixing, so that the instrument can
be used with the same elements for applications with
different amounts of cables (9).

5 On the other hand, the cylindrical washers (8)
determine the separation space between the cylinder (6)
and the central body (1) for the passage of the cables
(9) of application, so that for applications respect to
10 cables (9) with different diameter, it is only necessary
to substitute the washers (8) so that the space between
the cylinder (6) and the central body (1) is in each
case the adequate for the diameter of the corresponding
cables (9) of application.

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